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ABSTRACT

This guide contains information and activities designed to be used during National Wildlife Week. These curriculum materials are organized into three stages and offer a coherent progression from learning about natural communities through understanding human communities and human responsibilities for natural communities to offering opportunities for community service by students. Stage One activities will help students understand certain ecological principles related to natural communities. From the scientific principles of interconnectedness, niche, and succession, learners are introduced to ecosystems thinking. The next four activities are grouped into Stage Two and focus on human communities as dependent upon and embedded within natural communities. The curriculum culminates in Stage Three activities which allow learners to realize the potentials of community service for human conservation of natural resources. Some activities encompass all age levels while others are directed toward specific age groups. Each lesson plan lists learning objectives, grade levels, time and materials required, and related school subjects. A glossary, resources list, World Wide Web sites, and a list of organizations are also included. (PVD)

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NATURE'S WEB

Communities & Conservation

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National Wildlife Week Educator's Guide

April 20-26, 1997

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NATIONAL WILDLIFE FEDERATION

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Introduction to Nature's Web: Communities & Conservation

Themes for National Wildlife Week 1997-2001

"People and Nature: Our Future is in the Balance" is the motto of the National Wildlife Federation. It expresses our concern that the natural communities upon which we depend also depend upon us. This motto expresses our conviction that it is a human responsibility to conserve natural resources wisely and thoughtfully in order to ensure that they sustain future generations.

In keeping with the mission of the National Wildlife Federation (NWF) and its commitment to education and promoting an understanding of the interconnections between human and natural communities, we anticipate the overarching theme for the next five years of National Wildlife Weeks will be "Nature's Web."

In Nature's Web, we invite you to see the interconnected wholeness of nature--which is to see more than the separate parts. Even as individual silk strands under various dynamic tensions comprise a complete orb web, so do the many aspects of nature we study comprise an integrated whole. This is nature's web--even more a wonder of beauty and genius than a spider's web.

Given the richness of this theme, plans are underway to expand it into a series of subthemes over the years 1997-2001, each of which will have its own particular educational goals. The subthemes are intended to illustrate the ever-increasing complexity of social and environmental issues.

Specific future subthemes have yet to be identified, but the structure of the 1997 materials will serve as a template for the next five years.

We also hope to have materials available earlier in coming school years, and encourage you to use them at any time that is convenient in your curriculum planning. Further, through the questionnaire and documentation of your activity, we seek your active participation and communication. **We invite your response to this year's materials and to the theme of Nature's Web.** Please send your comments or suggestions to us at National Wildlife Week, National Wildlife Federation, 8925 Leesburg Pike, Vienna, Virginia, 22184; or e-mail them to wwwednwf@nwf.org.

Theme of National Wildlife Week 1997

The concept of a community--interacting populations sharing space and time--organizes the interconnectedness we understand to exist in nature. It helps us to see forests, shorelines, marshes, watersheds, and other dynamic environments as systems in which organisms and inorganic materials are bound together in energy exchanges, food relationships, and other interactions which constitute nature in a particular environment.

The beauty and complexity of these natural communities often inspire us; and their delicacy and vigor sustain us. National Wildlife Week has long emphasized such communities, promoting their understanding and conservation--a practice of wise and thoughtful natural resource consumption. In addition, this year's theme includes human communities, thus helping your students experience senses of identity and place as members of communities ranging from classrooms to cities. These communities are diverse and complex, and depend for their survival upon the careful use of resources from natural systems. People, too, are part of nature's web.

The theme of National Wildlife Week 1997 embraces an understanding of the concept of ecosystems-communities in nature.

It explores three important concepts:

- **Human beings exist in communities which depend on natural communities**
- **The human community has responsibility for the natural community**
- **Students can engage in community service to conserve natural resources.**

These materials provide ways to teach the natural community concept, the concept of human communities in relation to natural communities, and the concept of community service on behalf of conserving natural communities and the whole of nature's web.

Educator Background

Learning Goals for this Educator's Guide:

- **To introduce ecological principles related to natural communities.**
- **To convey the richness of the interconnection between natural and human communities.**
- **To experience a sense of identity and a sense of responsibility as a part of nature and as a member of a community.**
- **To exercise a conservation ethic through community action.**
- **To inspire respect for the profound ecological interconnections in communities, including those we do not fully understand.**

Curriculum Concepts

Natural Communities

A natural community is a group of plants and animals living in the same habitat. The habitat is the place that supplies the organism with its needs--food, water, and shelter. The many complicated relationships between the members of a community can be thought of as a web of life, in which living things seem to be in balance. Considering a spider web--its strands pulling on and supporting one another--can be helpful to our thinking about the complex and dynamic tension of ecological relationships.

Although this metaphor has limits in that it may simplify and disguise relationships we do not understand, it provides us with a strong image of interconnections.

Human Communities

All things, including communities, are connected to one another. As a culture, human beings participate in many rich communities. As organisms, human beings also impact their natural communities. With every action we take, natural communities feel and respond to human influences. Often, we are only barely aware of the full impact of our actions' consequences on natural communities; human decisions have both intended and unintended consequences. Through the practice of many academic disciplines, we can thoughtfully investigate these choices, actions, and reactions.

Community Service

Human beings can learn to use natural resources with an increasing awareness of the limits of natural communities. This conservation education concept means that we are uniquely responsible for appreciating the value of natural ecosystems and our dependence upon them. Conservation is the process of natural resource decision-making that keeps in mind the limits of the web upon which we depend. It includes thoughtful and, sometimes or preservation so that the web is sustained for the future. These decisions are guided by a conservation ethic. Often, our ethics compel us to take action on behalf of our concerns. Effective environmental education provides learners with the knowledge and skills to fulfill this ethic.

Curriculum Organization

Stage One: **Natural Communities**
Stage Two: **Human Communities**
Stage Three: **Community Service**

This guide provides information and activities to use during National Wildlife Week, April 20th to 26th, 1997--or at any time. These curriculum materials are organized into three stages. They offer a coherent progression from learning about natural communities, through understanding human communities and human responsibilities for natural communities, and finally to offering opportunities for community service by students.

We have grouped as Stage One the first three activities--those which will help students understand certain ecological principles related to natural communities. Activities from Stage One focus on understanding natural communities, grounding the learners in fundamental principles of ecology relevant to the theme of "Nature's Web: Communities and Conservation." From the scientific principles of interconnectedness, niche, and succession, learners are introduced to ecosystems thinking.

The next four activities are grouped as Stage Two; they focus on the human communities as dependent upon and embedded within natural communities.

Through investigations of their place and time in the larger natural community, learners may begin to realize their role and impact upon it, using the language and understanding gained in Stage One.

The curriculum culminates in the Stage Three activities. These activities will carry learners beyond the classroom and into the community. They will allow learners to realize the community service potentials for human conservation of natural resources.

The curriculum concept suggests that a progression through the stages has the greatest value for achieving the learning goals of National Wildlife Week 1997. We suggest charting a path through the stages by doing a Stage One, then a Stage Two, followed by a Stage Three activity. However, it is not essential that all the activities be completed in the order we give; nor even that you choose activities sequentially from Stages One, Two, and Three. You will be the best judge of the appropriateness of activities according to the ages of your learners, their developmental levels, and experience with their environmental education.

It is hoped that these materials will be useful and relevant across the grade levels. This will require some adaptation and creativity on your part. We have organized the grades into early (K-2), intermediate (3-5), and upper (6-8) levels. Several activities are written for all three levels through extensions of the basic activity; some are only for certain levels.

It is important to note that *the stages do not correspond to the grade levels. Stages contain activities for all grade levels.* For example, older learners still need to experience and appreciate the wonder of natural communities in Stage One; younger learners can engage in effective community service in Stage Three.

We have identified the school subjects to which each activity relates. However, we do not need to see the world through only one discipline or another. Natural and human communities cross the boundaries of such views and need to be understood in integrated ways--especially when taking action for these communities. Thus, the activities include study in traditional disciplines and offer opportunities for interdisciplinary study also.

Those of you in departmentalized settings may wish to pass this Educator's Guide along to colleagues who might find it beneficial to teach in their subject areas.

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Stage One

The Web of Life

Learning Objectives:
- To describe dynamic interconnections among elements of the local natural community.
- To define food chain and food web.

Grade Level(s):
K-2 √ 3-5 √ 6-8 √

Material(s) Required:
A ball of soft, breakable string

Time Required:
30 minutes

School Subject(s):
Science and environmental education

Lesson Plan and Extensions

This is the classic activity of environmental educators to demonstrate interconnectedness. Surely, millions of children have enjoyed being bound together in this representation of nature's web. Each relationship between living members of the immediate environment is illustrated by a connection of string. Taken together, the multiplicity and interdependence of relationships take on the appearance of a web as they aredemonstrated here—as in the true interconnectedness of living beings.

Have the children sit in a circle and ask them to think of what makes up the local environment. Ask a student to name a plant that lives nearby and ask that person to hold the end of the string. It is safer if you have the students hold the string rather than tying it to their wrists or fingers. Ask if anyone can name an insect or animal that eats the plant. As you pass the string to that student, announce that this is an example of one link of a food chain.

Continue to connect child to child, organism of the local ecosystem to organism of the local ecosystem. Also remind children that even the fiercest predators are "eaten"--upon their deaths, by decomposers such as bacteria and fungi, and by scavengers called detrivores, (insects and other small animals that eat the remains of already dead animals and plants), such as litter mites, millipedes, earthworms, snails, slugs, and certain fly and beetle larvae. Decomposers and detritivores close the loop of food chains, demonstrating the cycle of energy flow.

As you make a string connection, ask the students to share their knowledge of the food relationships. They may state more relationships than you will actually connect; do not limit individual contributions, but do periodically review exactly who is eating whom.

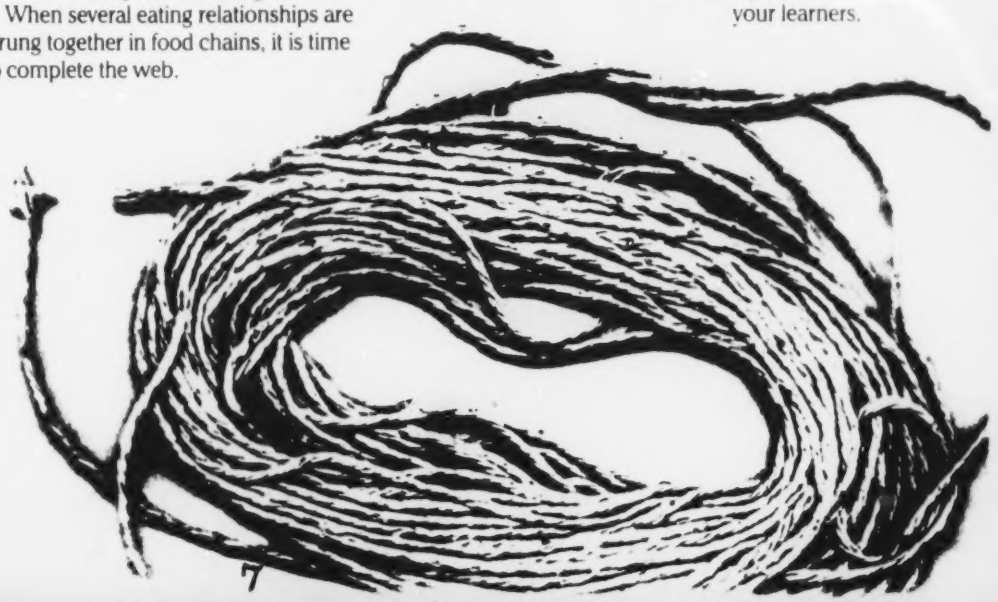
When several eating relationships are strung together in food chains, it is time to complete the web.

Now include as many non-living elements as possible: soil, water, air. Ask the children to explain relationships between living and non-living elements of the local community. Connect each element to another as before, although these may not be food relationships.

After the web of life is made, the local ecosystem is represented. Ask what will happen if an element is removed--say, one of the species is lost to habitat destruction. With all eyes closed, have that student tug slightly as the element leaves the web. Ask each person who felt the tug to give a soft tug, also. Trace out and discuss the impact of any single element's departure on other elements of the web. Highlight the importance of all elements in maintaining a balanced web of life.

Caution students in advance to be gentle and not to pull until asked to do so. Also, remember to have the students hold the string, rather than tying it to their hands. This will be much safer as ecological impacts are felt throughout the ecosystem!

This activity is adaptable to all age groups by the level of sophistication in your discussion of food relationships. Using the local environment generates appreciation for the immediate community of which students are a part--as opposed to, say, the African savannah, whose large mammals are well-known and much photographed. You may wish to try another web in which a specific natural community rather than the full, immediate ecosystem is portrayed. For example, if you have studied the forest, wetlands, ocean, or any assemblage of elements which share time and space. You may also wish to make another web to portray the social system of your school or neighborhood. If you pursue this possibility, make certain to define beforehand the interdependencies, such as cooperative help and friendships, that will link your learners.



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Stage One

Spinning the Web

Learning Objectives:
- To explain the concept of niche by studying a spider's niche.
- To observe a spider closely.

Grade Level(s):
K-2 √ 3-5 √ 6-8 √

Material(s) Required:
Source of information on spiders, their silk, and webs

Time Required:
2-3 class periods

School Subject(s):
Science and Literature

Helpful Resources for this Activity:
"Incredible Insects," *Ranger Rick's NatureScope*, Washington, D.C.: National Wildlife Federation, 1989;

"Incredible Insects Discovery Pac," *NatureScope*, Washington, D.C.: National Wildlife Federation, 1988;

Charlotte's Web White, E. B.: . New York: Harper and Row, 1952.

Lesson Plan and Extensions

A spider's web is stronger than it looks. Although it is made of thin, delicate strands, the web is not easily broken. However, a web gets torn every day by the insects that kick around in it, and a spider must rebuild it when it gets full of holes. Charlotte liked to do her weaving during the late afternoon, and Fern liked to sit nearby and watch. One afternoon, she heard a most interesting conversation and witnessed a strange event. "You have awfully hairy legs, Charlotte," said Wilbur, as the spider busily worked at her task.

"My legs are hairy for a good reason," replied Charlotte. "Furthermore, each leg of mine has seven sections--the coxa, the trochanter, the femur, the patella, the tibia, the metatarsus, and the tarsus."

Wilbur sat bolt upright. "You're kidding," he said.

"No, I'm not, either."

"Say those names again. I didn't catch them the first time."

"Coxa, trochanter, femur, patella, tibia, metatarsus, and tarsus."

"Goodness!" said Wilbur, looking down at his own chubby legs. "I don't think my legs have seven sections."

"Well," said Charlotte, "you and I lead different lives. You don't have to spin a web. That takes real leg work."
(Charlotte's Web, pp.55-56)

E. B. White's remarkable fictional spider, Charlotte, had the capacity to weave English words into her web. All who saw them said it was a miracle. As stated by Dr. Dorian, another character in Charlotte's Web, "But nobody pointed out that the web itself is a miracle" (p.109). If not miraculous, spiders certainly occupy their insect-eating niche with extraordinary diversity and amazing efficiency.

Looking at one member's relationships to the rest of the natural community can help reveal the complexity of ecosystems. The collection of all functions that an organism performs upon its habitat, and by which its habitat limits that organism, is called its ecological niche: "what it does where it is and what is done to it" (Kormondy, 1984). Here we look at the spider, from whom we take our metaphor of the web of life (and of the World Wide Web!).

Find out about the spiders that live near you--and about all of arachnids that spin remarkably strong silks into many ingenious and enchanting types of webs. The goal is to learn about ecological niches by focusing on that of the spider. Resources for students' research include the CopyCat Page, CD-Roms, videos, the many good books for young readers, and the Web--the World Wide Web, that is!

After information is gathered and shared, have students turn to direct observation to capture information. Give any appropriate warnings about poisonous spiders that may live in your environment. Have students observe a "wild" spider at home or at school, inside or out. They are ubiquitous!

Have students sketch the spider, the web (and its construction, if possible), and the prey. After careful observation of web construction, explain the niche occupied by the spider, focusing on what it eats (and what eats it), and how it captures its prey. Build this understanding based on what students learned in their observations.

To extend this activity to students of upper grade levels, discuss the meaning of the web in terms of nature's web, the web of life, the World Wide Web, and other common uses of the term.

With your accumulated knowledge, you can extend this activity into art--including trying to weave a web of thread or string. With younger and intermediate students, Charlotte's Web could be an inspiration for creative writing, drama and a read-aloud pleasure.

Charlotte's web never looked more beautiful than it looked this morning. Each strand held dozens of bright drops of early morning dew. The light from the east struck it and made it all plain and clear. It was a perfect piece of designing and building. In another hour or two, a steady stream of people would pass by, admiring it, and reading it, and looking at Wilbur, and marveling at the miracle. (p.147)

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CopyCat Page

The Amazing Arachnida: The Spider

Kinds of spiders

• Very few of the 100,000 species of spiders in the world are dangerous to human beings.

Specific spiders

• Nimble crab spiders can turn white, pink, or yellow to blend with flowering vegetation.
• Jumping spiders pounce on their victims from distances of forty times their own body length.
• Drop for drop, the black widow spider's venom is more potent than a rattlesnake's.
• Some spiders mimic ants in both appearance and behavior. This protects them from predators that find ants distasteful.
• The harvestman, or daddy longlegs, spider has only two eyes and can regenerate its legs.
• The golden wheel spider can spin at 44 revolutions a second (if it were a car wheel, the car would be traveling 200 miles an hour!); they make the first confirmed use of the wheel by an animal.

Daily life

• Spiders in the wild regularly build new webs almost daily. A web with almost 1,000 individual attachments takes a spider only half an hour to complete.

Life history

• Most spiders live one year; tarantulas can live up to 30 years. Most are solitary; a few social ones share the same web.

Silk

• Although it may be one millionth of an inch thick, spider silk is incredibly elastic: some can stretch an extra one-fifth in length and are stronger than steel wire of the same thickness. Spider silk absorbs more energy before it breaks than any other material on earth.

Spiders . . . not insects

The differences between spiders and insects: What counts?

• Legs: spiders have eight; insects, six. As Charlotte said, spider legs have seven sections: the coxa, the trochanter, the femur, the patella, the tibia, the metatarsus, and the tarsus.
• Compound eyes: spiders don't have them; insects do.
• Antennae: spiders have none; insects have a pair.
• Spiders annually destroy one hundred times their number in insects. But their diet is not limited to insects: some spiders catch and eat small fish, tadpoles, and other spiders--even mates and their own young.

Spiders, spiders--everywhere!

• Spiders can be found four miles high in the Himalayas, in deserts below sea-level, and even parachuting far out over sea.
• Spider populations tend to average 50,000 in one acre of green area.

How they do what they do

• Orb-weaving spiders avoid traveling on their own sticky spiral threads, which they lay to trap insects. Instead, these spiders tend to travel on the radial threads.
• Jumping spiders have the keenest vision of all spiders: they can see images sharply up to one foot away. Mostly, though, spiders rely on sense of touch.

3

Stage One

Watershed Web: A Field Trip

Learning Objectives:
- To explain succession principles.
- To observe habitats closely.
- To define the term "limiting factor."

Grade Level(s):
K-2 √ 3-5 √ 6-8 √

Material(s) Required:
A vegetated area, preferably very wet (e.g., pond, stream, or wetland); notebooks or clipboards and pens; hand lenses (optional)

Time Required:
One hour

School Subject(s):
Nature study and science

Lesson Plan and Extensions

Ecology is often described as the study of the distribution and abundance of plants and animals. This definition is incomplete, however, because it fails to emphasize the non-living components of the environment; it also does not highlight the constantly changing nature of ecosystems. The distribution of plants, for example, draws attention to these missing criteria of a definition of ecology, since plants respond dynamically to the conditions of soil and water.

To actually witness succession--the pattern of the establishment and turnover of plant species--would require careful measurements on the same geographic area over decades. However, plant succession can be seen over space, as well as time. A very good place in which to observe a freeze-frame of plant succession is any vegetated area around a body of water, especially if that vegetation slopes down into a pond. Hypothesize with your class how wet the soil is as you travel away from the body of water. Do streams feed this body of water? Does the air humidity or temperature change depending upon the distance from it? How might these affect the distribution of plants around it?

Observing at the ground level--better still, with a hand lens--will allow you to gain the perspective of the much smaller organisms that typically inhabit such areas. Before setting out, make sure students are wearing appropriate clothing (long pants, long steeved shirts, etc.) and that they can identify poison ivy/oak/sumac or other such plants in your area. Crawl with your students in a path away from the water and test your hypothesis. Return to the body of water via a different route and compare your observations (in reverse order!). Encourage the children to leave the environment as they found it by not picking any of the vegetation. By discussing the activity with your group before reaching the study area, you can conduct it with a minimum of noise pollution--in quiet--and increase the likelihood of witnessing wildlife, as well.

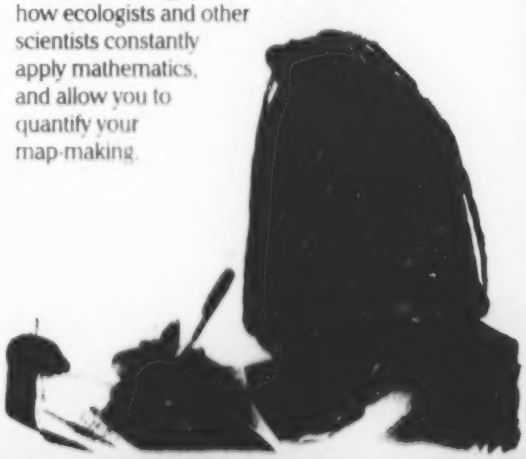
This setting can offer students of the intermediate and especially upper grade levels an excellent team-working exercise. On one piece of paper, roughly map the physical features of the land, and identify some paths away from the water. Assign a pair of students to each path, with one recording in a notebook (the scribe) what the other (the crawler) observes. The crawler chooses a landmark at a reasonable distance away from the water and then crawls along the ground toward it observing out loud any major changes in plants and soil conditions. Walking directly behind and occasionally re-orienting the crawler, the scribe records in the notebook his or her own number of paces along with any of the crawler's naked-eye, or hand lens, observations.

Regroup your students to share and record their observations on the map. What trends in soil conditions and plant distribution do your students notice? Where were plants more sparsely or densely gathered? Were they the same kinds of plants? Can you guess, or do you know, which of these plants tend to grow faster or slower? How might the contours of the land or other physical features, like trees, which might shade non-woody plants, have affected these? Mapping such observations may suggest patterns of plant distribution and soil conditions--a snapshot of plant succession.

Limiting factors are the conditions that most impact how organisms develop and persist. Among animals, a common limiting factor is food. Shading is a factor that limits plant abundance and distribution, since it impedes how plants get the source of their food--the sun. Water limits both animals and plants.

If your study area was a stream, this pattern governed by limiting factors may appear simply as strips of plant and soil types running parallel to the streambanks. If your study area was a pond, this pattern of similar plant growth and soil conditions may be a series of rings, since the ground will be drier at greater distances from the pond, and water is a principal limiting factor of plants. Now test this out by sending the pairs, with the crawler and scribe roles reversed, along the parallel strips or rings of similar plant distribution and soil conditions. Can students identify particular zones where only some kinds of plants appear? What characteristics might they share in common?

To extend the activity to another level of difficulty, conduct a *transect* study by collecting data at intervals along a straight path such as apparent soil moisture and pH; or conduct a seedling survey, counting all plants of a certain height (usually, less than 10 cm) in neighboring square meter areas. This will give your students field biology practice and show them how ecologists and other scientists constantly apply mathematics, and allow you to quantify your map-making.



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Stage Two

What is Your Community?

Learning Objectives:
- To generate different maps and definitions of community.
- To explore and then identify your learning group's own communities.

Grade Level(s):
K-2 X 3-5 √ 6-8 √

Material(s) Required:
pencils and large pieces of paper

Time Required:
30-40 minutes

School Subject(s):
Social studies and geography

This activity is adapted from "Liveable Communities," a teaching unit from Windows on the Wild, a National Environmental Education program of World Wildlife Fund (1996).

Lesson Plan and Extensions

Ask students to draw their community. The instruction is purposely ambiguous, so if students ask for further directions, tell them that they should complete the assignment as they understand it. Keep talking between students to a minimum, too, so that they will not unduly influence one another.

When your students are ready, invite them to share their initial drawings. Did they draw maps of their neighborhoods? of the whole city? only their homes? their school? Did anyone include people or other organisms, such as pets or trees? landmarks, such as buildings or billboard advertisements?

Enlist the students' help to identify and organize the kinds or scales of the communities that they drew.

Continuing the method of constructivist teaching, now invite students to brainstorm a definition of community. When students have exhausted their ideas of communities, fill in any gaps by sharing with them these dictionary definitions of community: all the people living in a specific locality, including its inhabitants; a body of people sharing a religion, a profession, etc.; a group of animals or plants living or growing together in the same area.

If discussion seems to drift into particulars, re-focus by saying, for instance, "Remind me what makes those parts into a community" or asking "What tells you that this is part of a community?" or "Where does this go in relation to its community?"

One way to stimulate this discussion is to ask students what they drew first: did a student begin drawinghis or her community by depicting herself in the middle of her yard? Did another student begin the activity by depicting his favorite local place to go? Use these self-reflections to explore where a community might start; and to garner a better understanding of what individual students organize their notions of community around.

Another way to advance dialogue on the definition of community is to ask students what might be missing from their initial drawings. Ask students if communities are always geographic, must they occur in a place? Could a community still exist if it were missing some part, or if something in it changed dramatically? How might a missing or changed part of a community affect the whole of the community?

One final way to encourage discussion is to have children think about or look at maps. Does every point on a map represent a community? Why? Do all communities have boundaries, such as the ones dividing states, provinces, and nations? Does their village, town, or city have boundaries?

Bring together your learners' brainstormings and attempt to forge one group definition. Encourage the children to consult dictionaries or encyclopedias or maps, but to always state community in language that they understand.

Once you have a group definition of community, have each child draw a map of her or his own individual community. If it is meaningful to them to do so, have students depict and explicitly state if their communities have boundaries. Allow them the same amount of time to complete these maps as you allowed them for their initial mappings. Afterwards, invite students to share their maps and to state how their community changed from the first to the second mapping. Collect the maps and, if the scales are compatible, try to connect them or show how they might be connected.

As an extension, ask students if they believe animals and other organisms (such as trees) have communities. If some students have pets, invite them to speak on behalf of their pets about what their pets' communities are. Does an organism's community begin and end anywhere, such as a cage, house, yard, tree, or pond? What is different about the students' communities and animal communities? What is the same?

Is this your *community?*

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Stage Two

Required to Consume

Learning Objectives:
- To investigate eating habits, their influences, and their impacts.
- To define the concept of food pyramids.
- To quantify student calorie consumption and eating practices.

Grade Level(s):
K-2 √ 3-5 √ 6-8 √

Material(s) Required:
Calorie conversion information

Time Required:
45 minutes

School Subject(s):
Science, mathematics education and social studies

Helpful Resources for this Activity:
"Calorie Values," pp.3-7 from Rombauer, Irma S. and Marion Rombauer Becker: *The Joy of Cooking.* Indianapolis, IN: The Bobbs-Merrill Company, Inc., 1964.

Lesson Plan and Extensions

All organisms consume resources to survive. For human beings what, how and how much, we consume is, to some degree, a choice. Thus, resource consumption is a universal practice with far-reaching consequences; and responsible consumerism is a critical and powerful component of an environmental ethic.

Most of us know and can guess the fuel economy, in terms of miles-per-gallon, of several makes of cars, but remain ignorant of the energy exchange of our own bodies, in calories-per-serving. Students can use the accompanying CopyCat Page to explore their own and their peers' eating habits, both quantitatively and qualitatively. Through interviewing, learners can see the diversity of the human community's food consumption ethics, behaviors, and influences. First have pairs of students interview one another using the CopyCat Page. Tabulate and analyze the quantitative data according to your students' mathematical abilities. For more data and comparisons, have the students interview a person at home.

Ask children where human beings are in the food pyramid. Be careful to distinguish between food pyramids, which are comprised of different types of consumers, and another "pyramid" pertaining to food, the USDA of food groups. Where do we get our energy? Identify, with the children, where human beings go on the food pyramid. Ask your students how much energy they derive from the food they eat; compare their responses to this with their answers to questions of how far a car can go on a gallon of gasoline, or how long a double-A battery can operate a portable tape player. Can the energy in various foods be measured?

Explain that energy transfer from one level in the food pyramid to the next is roughly 10 percent efficient (but note that this value can range from about 2 to 24). From this rate, explain that, as a general rule, 100 pounds of plants could support 10 pounds of herbivores, which in turn could support one pound of carnivore.

How does human efficiency of meat-eating and vegetable-eating compare with that of a car running on gasoline (about 30% energy efficiency)? Practice converting energy exchanges from one level of the food pyramid to another using different numbers, such as students' weights and their dietary choices.

As an extension for the upper grade level, investigate some euphemisms (polite expressions used in place of other words) and etymologies of words (the histories of how words evolved into their present meanings). These and other phrases and words of etymological interest are listed below. How have human activities shaped our notions about food as reflected in the English language—and vice versa?

- **to eat like a bird**
- **to eat like a pig**
- **to wolf down**
- **bread**
- **burger**
- **broccoli**
- **calorie**
- **carnival**
- **carrot**
- **chocolate**
- **cola**
- **company**
- **dairy**
- **diet**
- **fat**
- **flavor**
- **fruit**
- **giblet**
- **herbal**
- **lentil**
- **meal**
- **meat**
- **nectar**
- **nurse**
- **pale**
- **protein**
- **sandwich**
- **spice**
- **starve**
- **till**
- **vegetable**
- **vegetarian**

CopyCat Page

Diet Right?

- How many times do you eat in a day? Do you eat about the same volume of food at every meal? in every day?

- What is your favorite meal? What is your single most favorite food? About how often do you enjoy these?

- What is your least favorite meal? What is your single least favorite food?

- Do you make your own meals? Which ones? How often?

- Do you eat fast food? How often?

- Which foods do you think have the most energy content per serving? How would you test your guess?

- Do you eat only when sitting down? How many times a week to you eat while sitting in a chair and at a table? How often do you eat with others?

- Do you avoid certain foods? If so, explain why (e.g., taste, allergic reaction, political choice, religious restriction, etc.).

Win a Trip!

to a

National Wildlife Federation®

Conservation Summit

The National Wildlife Federation established National Wildlife Week in 1936. Since that time we have been supplying teachers with classroom materials related to each year's conservation theme. We now provide almost 650,000 teacher packets each year. 620,000 are delivered by volunteers associated with one of the many organizations affilliated with National Wildlife Federation nationwide.

Every now and then we need to see how the system is working and what we can do to improve it for you, the teachers, who are the end-users of our efforts.

In return for helping us find out how we are doing, you have a chance to win one of three exciting prizes. A drawing will be held to determine the winners. Any teacher responding by June 1, 1997 is eligible.

First Prize: A summitship to an NWF conservation summit in the Adirondack mountains of New York state, where all kinds of fun outdoor and educational activities will take place with special events and workshops for teachers. (includes $500.00 transportation stipend)
Second Prize: 25 teachers will receive for their classrooms a one year subscription to RANGER RICK, the all time favorite nature magazine for kids.
Third Prize: up to 180 teacher "success stories" will be posted on the National Wildlife Federation page on the World Wide Web complete with any pictures you send.

Here's what you have to do:
1. Remove this centerfold from your Activity Booklet.
2. Complete the Teacher Questionnaire portion of the centerfold *(must be completed to be eligible for any of the prizes.)*
3. With your class, complete the success story part of the centerfold. If you choose not to do this part you will still be eligible for 1st and 2nd prize, but not 3rd.
4. Put the completed application in a stamped envelope and mail it by June 1, 1997 to National Wildlife Week Contest, 8925 Leesburg Pike, Vienna, VA. 22184-0001.
Option: You may also submit your application via internet by filling out the form on the NWF web site: http://www.nwf.org

National Wildlife Federation Educator Questionnaire

Please mark the boxes next to the statements that apply. Some items may have more than one answer.

1. How did you receive your 1997 National Wildlife Week packet?
- ❑ Via U.S. Mail addressed specifically to me.
- ❑ Via U.S. Mail to my school, but addressed to no particular teacher currently on staff.
- ❑ Via a National Wildlife Federation affilliate specifically for me.
- ❑ Via a NWF affilliate who delivered it to my school for any interested teacher
- ❑ Not Sure (If the envelope has a Non-Profit US postage box in black, it came by US Mail.)

2. Have you received National Wildlife Week materials in the past? (If "no" skip to #5)
- ❑ yes ❑ no

3. Please check all that apply.
- ❑ I received the 1996 packet on Wetlands last year.
- ❑ I have received packets each year for 2-5 years.
- ❑ In the past five years I have received packets some years but not others.

4. If you received your packet by mail, how did you get on the National Wildlife Week mailing list?
- ❑ I responded to an article in Ranger Rick.
- ❑ A fellow teacher had a set of materials with the address.
- ❑ I had a packet from a former year with the address.
- ❑ A college professor recommended it.
- ❑ I heard about it by word-of-mouth and researched the address myself.
- ❑ Other (please specify) _____

5. Approximately when did you receive the current, 1997, National Wildlife Week packet?
- ❑ January or earlier ❑ February ❑ March ❑ April

6. Please check all the choices that apply to how you used this year's packet.
- ❑ I did 4 or more of the activities spread out over 2 or 3 months.
- ❑ I did fewer than 4 activities over a 2 to 3 month period.
- ❑ I did 4 or more activities in April around National Wildlife Week.
- ❑ I did 1-3 activities in April around National Wildlife Week.
- ❑ My class and I did a culminating activity during National Wildlife Week.
- ❑ I did not use the packet at all during this school year, but I will keep it and use it in the fall.

7.Check all the statements that you agree with about when you would like to receive your packet.
- ❑ Receiving the packet at the start of the second semester is ideal for planning my spring activities.
- ❑ I like doing the activities as a unit during the Spring.
- ❑ I would like to spread the activities out during the whole year with a culminating activity in April.
- ❑ I would incorporate more activities if I had the packet earlier in the year.
- ❑ It is difficult to plan activities during National Wildlife Week because of standardized testing.
- ❑ I would lose the packet before Spring if I received it too early.

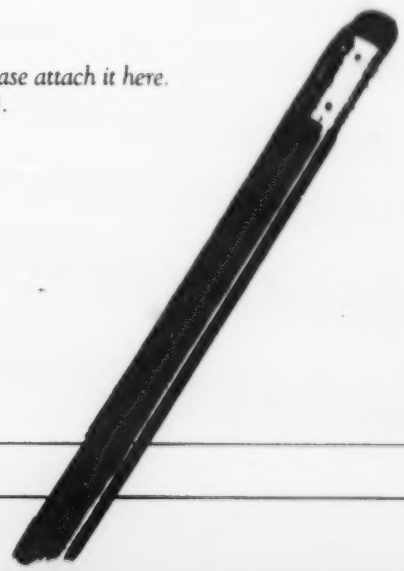
Rate Us!

We want to know the successes you and your students had working with the Wildlife Week packet.

We are especially interested in learning about any culminating activities or service projects you may have done that were related to the topic and how the activity packet helped you achieve this.

Please tell us in 100 words or less what you did as a part of your National Wildlife Week activities.

If you have a picture you would like to share please attach it here.
(Pictures will not be returned).



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Dear Student:

Please tell us in **25 words or less** what the most important or interesting thing you learned about the **Web of Life** or that you did to presrve the Web in some way. *(Students may work individually or in teams to answer this question.)* If your class is selected for posting on the NWF Web site we will include a sample of up to 5 student entries per class _____

_____

_____

_____

_____

Personal Information: *(Must be completed to be eligible for drawing.)*

Teacher Name _____

School _____

School Address _____

SummerAddress _____

☐ Please add my name to the National Wildlife Week Mailing list so that I may receive packets directly.

We would like to find out more about how useful these materials are for you and how they supplement your curriculum.

☐ I would be willing to be surveyed by phone on educational issues related to NWW materials.

School Phone _____ **Home Phone** _____

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Stage Two

Inspired to Conserve

Learning Objectives:
- To state Rachel Carson's contributions toward the American conservation movement.
- To state the contributions toward the American conservation movement of a writer of the students' choice

Grade Level(s):
K-2 X 3-5 X 6-8 √

Material(s) Required:
Biographies, books by and about Rachel Carson

Time Required:
1-2 hours or more

School Subject(s):
Language arts and history

Helpful Resources for this Activity:
A biography of Rachel Carson and the books she wrote are listed among the resources on page 26.

Lesson Plan and Extensions

American intellectual history is uplifted by joyous lovers of nature. Their voices speak timelessly across the history of our relationship to this land. Tecumseh, Anna Botsford Comstock, Chief Sealth (Seattle), John Muir, George Washington Carver, Gifford Pinchot, Ernest Thompson Seton, and many others have spoken of the beauty of the land and its profound importance in our lives as a people, and in our lives as individuals. These conservationists' passion, their mysticism, and their inspiration have transcended their own generations, and shaped the conservation practices and ethics of subsequent generations.

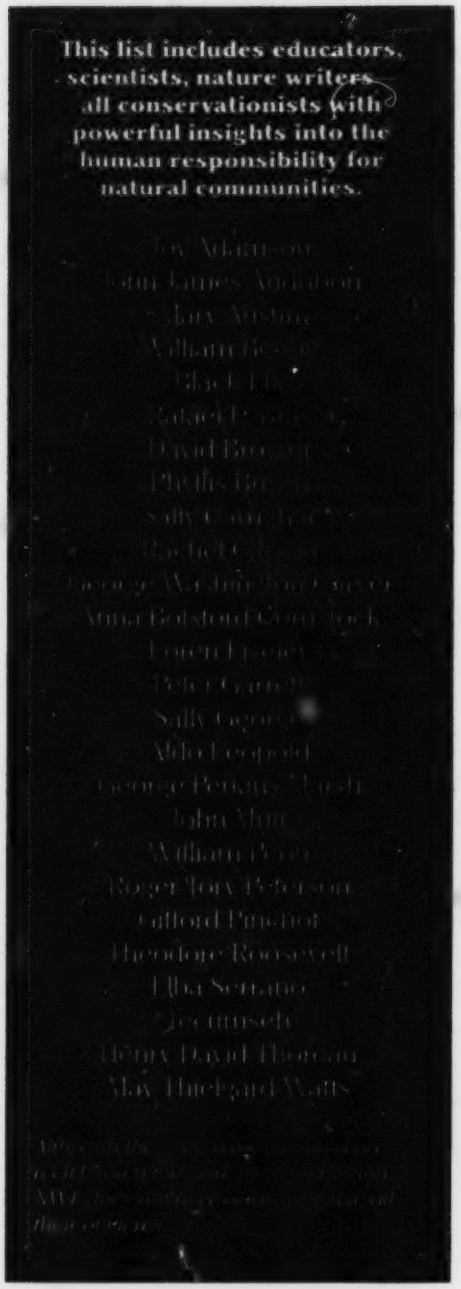
In *Sharing the Joy of Nature: Nature Activities For All Ages*, Joseph Cornell writes "Everyone, but children especially, is greatly influenced by role models. Uplifting stories from people's lives, shared with heart and spirit, awaken and expand our vision of what is possible and true. The life stories of the great naturalists are a wonderful tool for bringing alive not only inspiring nature wisdom and experiences, but a sense of the value of living by high ideals."

Cornell has outlined a four-stage "flow hike" which concludes with a stage to "share inspiration." We recommend his work to prepare students to get in touch with the inspiring likes of the great naturalists, but it is not essential to this activity.

Here, we suggest drawing on the life and work of scientist and writer Rachel Carson, who understood and communicated something of the consequences of human action upon the environment. Many excellent biographies, including those for young readers, are available. Her difficult life, her courage, the impeccability of her science, and her still-largely unheeded warning about human misuse of chemicals in the environment form the story of an American inspired to conserve. With older students, you may wish to use her own watershed work, Silent Spring. Perhaps the most important book of the twentieth century, it awakened the nation to its responsibilities towards the environment, and its subsequent ecological crisis. With all ages of students, you can read aloud her books about the sea, which evoke the power and mystery of shore and ocean.

Ask the students to keep a journal of their reactions to the life story of Rachel Carson and to her writing as they read them or you read them aloud.

Have them write about the role models influencing their own lives. Who has helped form their feelings about the environment? What are their attitudes toward the natural world?


This list includes educators, scientists, nature writers, all conservationists with powerful insights into the human responsibility for natural communities.

What significant life experiences have they had in nature?

Have each student select a conservationist or nature writer to research, keeping notes and reactions in the journal. In a report, have the student describe the influence of their chosen individual, as well as their insights and contributions in inspiring others to conserve. Drawing upon these life stories, discuss with the class how human beings have acted and can act on behalf of both human and natural communities.

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Rachel Carson's Words Still Live Today

Rachel Carson was a person who understood something of the consequences of human action upon the environment. She surely warned humankind to exercise caution in light of what we did not know.

The balance of nature is built of a series of interrelationships between living things, and between living things and their environment. You can't just step in with some brute force and change one thing without changing a good many others. Now this doesn't mean, of course, that we must never interfere, that we must not attempt to tilt that balance of nature in our favor. But when we do make this attempt, we must know what we're doing, we must know the consequences.

She was also a lover of nature with a profound philosophy of human responsibility toward the natural communities upon which we depend--and a clear sense of human power over them.

Only within the moment of time represented by the present century has one species—man—acquired significant power to alter the nature of his world. During the past quarter century this power has not only increased to one of disturbing magnitude but it has changed in character. The most alarming of all man's assaults upon the environment is the contamination of air, earth, rivers, and sea with dangerous and even lethal materials. This pollution is for the most part irrecoverable; the chain of evil it initiates not only in the world that must support life but in living tissues is for the most part irreversible. In this now universal contamination of the environment, chemicals are the sinister and little-recognized partners of radiation in changing the very nature of the world--the very nature of life. (Silent Spring, pp.5-6)

Further, she understood the importance of natural communities as places in which human beings grow and thrive and find meaning.

A child's world is fresh and new and beautiful, full of wonder and excitement. It is our misfortune that for most of us that clear-eyed vision, that true instinct for what is beautiful and awe-inspiring, is dimmed and even lost before we reach adulthood. If I had the influence with the good fairy who is supposed to preside over the christening of all children I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength. . . .

Is the exploration of the natural world just a pleasant way to pass the golden hours of childhood or is there something deeper? I am sure that there is something much deeper, something lasting and significant. . . .

There is symbolic as well as actual beauty in the migration of the birds, the ebb and flow of the tides, the folded bud ready for the spring. There is something infinitely healing in the repeated refrains of nature--the assurance that dawn comes after night, and spring after the winter. (*The Sense of Wonder*, pp.42-43, 88-89)

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Stage Two

What Did You Throw Away in School Today?

Learning Objectives:
• To measure your school's solid waste flow and composition.

Grade Level(s):
K-2 √ 3-5 √ 6-8 √

Material(s) Required:
Sorting tables, a large scale, bins for separating. Gloves and surgical masks (optional) materials for recording your data . . . and your school's own solid waste!

Time Required:
One and a half hours for research and other background work; time for follow-up auditing depends on accessibility to and volume or weight of solid waste, and detail of your audit.

School Subject(s):
Mathematics and social studies

Helpful Resource(s) for this Activity:
National Wildlife Federation's *Campus Ecology* and its 14 Campus Issue Packets.

Lesson Plan and Extensions

How much solid waste does your school contribute to the solid waste flow?

By studying your school's discarded supplies, you and your students can gain some measure of what you throw away.

Begin by assessing what you can and cannot investigate. What are the school's facilities? Where does your school collect its solid waste before it is hauled away? Is any waste diverted from this stream--disposed of elsewhere, or sorted and recycled or re-used? Next, determine what, how thoroughly, and how often you want to audit. What is a reasonable amount and timetable by which to weigh the solid waste generated by your school--all of it every other day? a sample every week? Do you have the motivation, muscle, and stomach to refine your solid waste audit into a study of its particular components?

Finally, in consultation with your class, set your own goals for this audit. For instance, you might aim to produce a year-end findings report for the administration; or initiate and maintain an in-school solid waste education program, complete with monthly press releases and classroom competitions; or collaborate with a neighboring NWF Campus Ecology initiative to track how much waste primary, secondary, and post-secondary education generates to graduate a learner. Determining beforehand how you will know when your audit is complete will help focus the process. Having a final product may also help you convince others of your commitment, as well as to rally all parties to the meaningfulness of the audit.

After this internal research, the next step is to reach out beyond your classroom walls. For political (and, potentially, economic) reasons, garner administrative support for your proposal. Obtain environmental and occupational health-and-safety requirements in the form of your schools' administrative policy and procedure manual; and dialog with school, regional, state, and federal officials and managers to help you comply with these regulations. Establish local media contacts, and alert them of your project, such as it may affect your community's quality of living and business. Finally, consider seeking support from third parties. For instance, college students from a neighboring Campus Ecology initiative could share their experiences with and information about the municipal waste management system; or offer help with transportation, labor, and writing reports.

Before beginning the actual auditing process, trace the origins and destinations of your school supplies. Start with your own classroom materials use. Do your supplies arrive in packaging that informs you of its contents, or where it was manufactured? (This can be an exercise of research or imagination in telling the actual story—or a creative guess—of how the product was developed and delivered to you.) Do these supplies get used for some academic subjects or grade levels more than for others?

Before conducting an actual audit, do a trial waste analysis of a small sample of trash by distributing roughly one large bag for every four students. This will help you determine the appropriate waste categories and establish a workable sorting method.

With a successful trial under your belts, ask waste-collection services for feedback on your proposal and for their schedule. Randomly collect at least five bags of solid waste refuse from your dumpsters prior to their pick-up. Transfer all of the refuse to your sorting site, then calculate and record the total weight and volume

NWF's Campus Ecology is a program to establish environmentally-sound practices on college campuses across the nation, but many of the program components can be easily adapted for elementary, middle, and high school campuses. Contact your regional organizing staff for project planning and coordination for more information:

National Wildlife
Campus Ecology Program
Educational Outreach
NWF
8925 Leesburg Pike
Vienna, VA 22184

General information:

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collected. Carefully sort the solid waste into two broad categories: "recyclable" and "other." How much of your present solid waste could you recycle rather than throw away? Could you decrease the volume of waste by packing or breaking it down better? What else could you do to reduce, refuse, re-use, or recycle your school's solid waste?

Over time, discern from your data what's being thrown away how quickly, and how much of it could be, or is, recycled. With your random sampling, you may not know the total amount of waste generated over a given period of time, so present your figures as percentages. If your sample is representative and not exhaustive, your figures will have limited accuracy and should be used with disclaimers. Even if your data provide a small window into the general types and quantities of waste your school produces, however, your students will better understand and appreciate the solid waste stream–and begin to learn what they might actually do about decreasing it.

This activity, in conjunction with "Indicators of Sustainable Communities," can be extended to give your students an idea of what and how much they are adding to landfills

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Stage Three

Creating an NWF Schoolyard Habitat

Learning Objectives:
- To investigate the basic elements of wildlife survival.
- To explain how habitat change affects wildlife.

Grade Level(s):
K-2 √ 3-5 √ 6-8 √

Material(s) Required:
Drawing supplies; field guides to native plants and animals

Time Required:
Between several weeks and several years

School Subject(s):
Art and science

Helpful Resources for this Activity:
Noah's Garden: Restoring the Ecology of Our Own Back Yards; Stein, Sara. Boston: Houghton Mifflin Company, 1993

The Backyard Naturalist; Tufts, Craig. Washington, D.C.: National Wildlife Federation, 1993.

Lesson Plan and Extensions

In joining the more than 300 schools nationwide who have, since 1973, created habitats, in their school yards, you will provide your school and greater community with a wonderful opportunity to study and appreciate nature, while also offering refuge to your local flora and fauna.

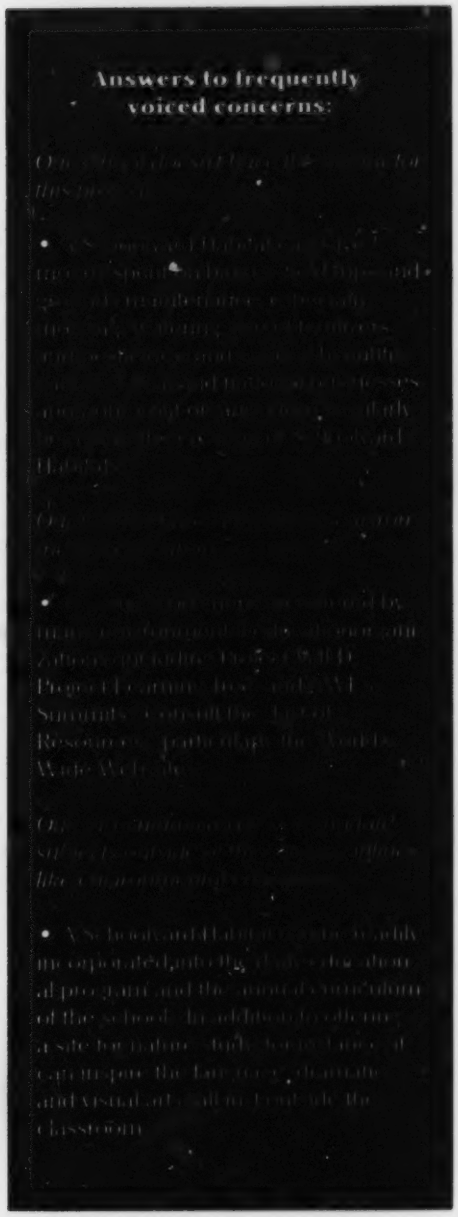
Brainstorm with your students about what they think the basic elements to survival are for both animals and people. Encourage lots of answers. Write down all the suggestions on the board. Once you have lots of ideas, have the students organize the suggestions into about four or five basic categories that make sense to them. Then explain that most environmental scientists believe that the four most important categories are food, water, shelter, and a place to raise young. Discuss how this list compares with the one developed by the class.

Next, discuss the kinds of animals that might live in and around your school grounds.

Organize your students into four groups, and ask them to look at your school grounds for basic survival elements through the eyes of native animals. Where have students seen squirrels on the grounds? Have they heard hatchlings peeping for food before school starts? Build on the principle of food pyramids for instance, to remind them that a squirrel is unlikely to visit the school if it cannot find acorns and other nuts on the grounds; and that most songbirds make their habitats in trees.

Now assess--again, through your learners' animal eyes--how inviting your school grounds are to wildlife. Conduct a plant inventory to see if fruit- and seed-bearing plants already populate your school environment.

As a class, research native plant and animal species, and then decide which you would like to install or invite to your school. What species and sizes of trees might attract native songbirds? Could your environment support a flower garden for migrating butterflies? As you act on these choices, begin modestly by setting up bird feeders and baths, piling protective cover of shrub clippings or discarded Christmas trees, and erecting bat boxes. Regular class observations will fuel your students' interest as you invite wildlife to your school.



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Have your school certified as a Schoolyard Habitat!

The key to getting your Schoolyard Habitat off the ground is to initiate inclusive, informed dialog as early as possible—well before you involve and excite your learners.

First contact local environmental organizations and agencies to enlist its support and networking resources. Contact NWF for more detailed information on planning, and on the Schoolyard Habitat experiences of other schools in your state.

Once you have the appropriate NWF materials consult with your school. Form a planning committee of administration, fellow educators, student representatives, custodial personnel, parents and other interested community members (including businesses and non-profit organizations, which might offer materials, labor, and funding), and local natural resource specialists and outdoor enthusiasts.

Professional direction and volunteer help will not only expedite the project, but can carry you through "dry spells" when you and your learners have other obligations--such as summer vacation! Their support can insure that the Schoolyard Habitat initiative does not wither. More importantly, in actively involving local community members and organizations outside of the school, you reinvest community support, involvement, and pride in its youth and school.Once you have secured administrative approval, professional input, and volunteer support for a Schoolyard Habitat, engage your learners in evaluating your campus. Let your learners know that children like them, in schools across the nation, have successfully created and continue to enjoy their Schoolyard Habitats. Then map your school grounds, paying special attention to the areas that stimulate your students' imaginations, fears, and senses of identity. A Schoolyard Habitat provides an excellent opportunity for students to reclaim their school.

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9

Stage Three

Tracking Communities

Learning Objectives:
- To define sustainability;
- To identify and track an indicator of sustainability in your community;
- To learn the importance of oral history in the web of human community.

Grade Level(s):
K-2 X 3-5 √ 6-8 √

Material(s) Required:
Index cards, a large sheet of paper, and pens

Time Required:
One hour to initiate, and less for regular follow-up tracking

School Subject(s):
Mathematics, history, and social studies

Helpful Resources for this Activity:
Monitoring Sustainability in Your Community; and *Securing Your Future: Pathways to Community Sustainability;* Nick Bartolomeo, and Laury Marshall, eds.

(see p. 26 for full listing)

Lesson Plan and Extensions

Distribute an index card to each student, and then ask them to write on their cards, anonymously and in silence, one major assumption about what life will be like 40 years from now in their neighborhood. Ask only that they be as specific as possible; and remind them that their assumptions may be either positive or negative. Collect, shuffle, and redistribute the cards. After some discussion, enlist the students in organizing the assumptions by kind and subject. For example, one group of cards could all be positive assumptions about the environment; another, negative assumptions about human health. Remember that some of these assumptions may reflect no change, or are "neutral"; or may be interpreted as equally positive or negative, such as "We will be able to bring back to life the dinosaurs that lived in our geographic region."

Now take this exercise in the opposite direction: ask each student to write down one major assumption about what life was like 40 years ago in their neighborhood. Encourage them to choose different topics from those they selected in envisioning the future; and to take risks by being specific. Again, collect, shuffle, and redistribute the cards; discuss the assumptions written on them; and organize them by kind and subject.

With these two sets of cards, ask students to find any "80-year trends" from their assumptions. Is anything, from their assumptions, remaining the same?

Extend your students' note card assumptions of the future and past into creative writings. Assign some students to write letters to a community member of the future (such as a grandchild); some to write short essays on their visions of local community in the future; others to interview parents, grandparents, and long-time residents (retirees or older business owners may be very good subjects) on the topic of their assumptions about the neighborhood's past; and some, to write letters from community members of the past to those of the present, based on these elders' personal experiences.

Students may consider: "How will/have people communicate/d or travel/ed differently in the future/past? What will/have they eat/en? What of our present generation will be/has been lost--forms of art, cultural values, endangered species, human conflicts? What might be/has been gained--new forms of entertainment, technology offering greater conveniences, global agreements, life-saving and--extending medical practices? How will/has the environment change/d? How will/have peoples' lives improve/d and worsen/ed compared with today?"

Once your students have adequately stretched their thinking into the future and the past, ask them how they might measure these changes in community life. Introduce the term sustainable development as *the long-term health of natural and human communities.* If any of their positive notecard assumptions were unchanged from the last to the next 40 years, it might exhibit sustainability, or the ability to meet present (or past) needs without compromising the ability of future (or present) generations to meet their own. Negative assumptions that held constant might be examples of stagnation. If the students can think up not merely assumptions of past and future, but can quantitatively track some measures applying to them, they can monitor an indicator of sustainable development.

This activity provides an excellent introduction to monitoring sustainability in your community. First, choose an indicator of community sustainability. Next, establish a reliable contact who can furnish you with data on this indicator, such as your local environmental protection office or waste management office.

As you become more familiar with this monitoring, graph the data as new figures are available, rotating the responsibility of obtaining and graphing the data among your learners. Does the indicator appear to be linear or exponential in growth or decline--or is it holding steady?

Calculate from one month or year of data the mean, median, or mode of landfilled waste. Finally, consider exchanging comparable data with neighboring schools to track the same indicator in your different communities.

We recommend, as one sustainability monitoring action, tracking the pounds of solid waste per capita that your community landfills.

Whatever the indicator of sustainability, it should:

- measure results, such as days with Air Quality Index in the good range, rather than efforts, such as annual Clean Air Act spending;
- be computable across communities, requiring standardized equipment, procedures, and timetables;
- remain reliable for up to two decades or more;
- offer easy access in that it is easy to gather and analyze at regular intervals;
- come from reliable sources, such as official records or community research.

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Stage Three

Our Concerns and Actions

Learning Objectives:
- To express concerns about one's community and environment.
- To take action on behalf of one's community and environment.

Grade level(s):
K-2 √ 3-5 √ 6-8 √

Material(s) Required:
The National Wildlife Week 1997 posters; art (or photographic) supplies and writing instruments.

Time Required:
Anywhere from a few days to several months.

School Subject(s):
Social studies, service learning, and art.

This activity is designed to be implemented together with the two posters contained in the 1997 National Wildlife Week kit. To obtain addtional copies of posters please contact your state NWF affiliate or write National Wildlife Week, National Wildlife Federation, 8925 Leesburg Pike, Vienna, Virginia, 22184.

Lesson Plan and Extensions

This culminating, community service, action-taking activity allows your students to fulfill the community service opportunity of National Wildlife Week 1997. The posters (included) reflect a synthesis of Stage One, which investigates plant and animal communities, and Stage Two, which explores human communities and how they relate to these natural communities. As a Stage Three activity, the posters fulfill the promise of environmental education, which always includes the opportunity to take some kind of action.

The complete text of the activity is contained on the accompanying two 17" x 22" posters. If you need the posters or wish additional copies, contact your state affiliate or write the National Wildlife Week, National Wildlife Federation, 8925 Leesburg Pike, Vienna, Virginia 22184; or e-mail us at wwwednwf@nwf.org

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The students shown on Poster Front One represent but a few of the many environmental concerns of today's youth. This generation is arguably better-educated and more concerned about environmental problems than any before it. Such concern can be unhealthy if it is based on partial knowledge or erroneous understanding. This might be the case with stories superficially reported in the popular media. Limited knowledge can also produce anxiety and diminish hope. Many students carry great, and even overwhelming, concern about the fate of the earth. How can we best educate young people about complex environmental problems? How can we help students share their concern in positive ways? How can we direct their worry toward useful action?

Many environmental educators have found that it is important to begin by simply allowing students to give voice to the problems as they see them.

Students often possess powerful, important insights. They may be articulate and knowledgeable from the same point of view as a scientist or activist, or they may perceive a problem from a fresh, innovative perspective. In the first part of this activity, what is important is the thoughtful expression of ideas and feelings about the environment and the experience of being acknowledged--to have one's voice be heard.

The activity is begun by inviting students to write, rather than speak, about their concerns related to the human and natural communities of which they are a part. Use poster front 1 as a starting point but encourage students to give expression to their own ideas. If you have students who do not have a concern or do not choose to express it, that's fine; invite them to express, in their writing, their feelings about their environment or hopes for its future. Using the examples on Poster Front One will likely be sufficient. For now, don't share Poster Front Two.

Show poster back as a place for their own ideas. Ask students to plan carefully how they wish to both express their concerns and display themselves. Have students rewrite, as necessary, their initial expressions of their concerns so that they are ready for display on the poster. A photograph or artwork that portrays their concern can be added to poster back 1. On the other hand, a self-portrait or an abstract impression might convey their concern better. Encourage students to feel free to exercise their creative juices through finger-painting, pencil drawing, "junk" art, or paper-folding. Juices of another art form might be to make judicious use of leaves, petals, and berries of native plants for ink.

When each student has prepared a self-image and a thoughtful expression of concern or hope, invite the students to share within the classroom community. Discussion, in advance, regarding the necessity of respecting each person's point of view is critically important. The empowerment in this activity derives in part from the acknowledgement of the importance of the concern of each person. Remember that the concerns of many modern conservationists, from Theodore Roosevelt to Rachel Carson, have been thought to be out of the mainstream. There are no right answers or better answers in this activity. This is an opportunity to explore the scientific underpinnings related to the issues and to gain skills in analyzing their validity. This means, of course, also respecting students who do not feel concern or who may disagree with a classmate's point of view.

Before posting your students' work, you may wish to hang Poster Front Two alongside Poster Front One to demonstrate how student concerns can lead to community service. By illustrating actions that real students have taken in response to their concerns, Poster Front Two offers encouragement for students to consider what actions might be possible and effective in response to their own concerns.

Upon completion of the discussion, invite the students to display their images and writing. If your group is large, go beyond the boundaries of the poster to other sheets of paper or to a bulletin board.

The poster offers a place to organize, display, and honor concerns--any way you choose to do this will work as long as all voices are valued.

Glossary

community: populations of organisms that share the same space and time. A population of human beings living in the same area at the same time is a human community.

community service: work, often volunteered, that is motivated by a community need or desire, and which is undertaken for its benefit.

conservation: a practice of wise and thoughtful natural resource

consumption: Two examples of conservation are preventing species extinction and reducing personal use of natural resources such as fossil fuels or paper.

conservation ethic: a coherent, consistent practice of wise and thoughtful decision-making and consumption of natural resources.

ecology: the scientific study of environmental processes--how organisms interact with each other and with their organic and inorganic environments.

environmental education: the process of learning about the relationship between people and their environment. Its goal is to develop a population aware of the environment and its problems and skillful in solving them.

food chain: a series of "who-eats-whom" links connecting organisms to one another. Ecologists represent one "link" of a food "chain" by drawing an arrow from one organism to a second organism that eats or otherwise consumes the first one.

food pyramid: a diagram of food chains that conveys the actual numbers of different types of consumers, as well as how those eating higher in food chains rely on those below them.

food web: food chains with all connections between consumer-consumed pairs of organisms.

habitat: where an organism lives; its "neighborhood."

niche: all the actions that an organism performs upon its habitat, and that its habitat performs upon that organism.

nonrenewable resource: a resource in limited supply and which cannot be replenished by natural processes for thousands of years, if at all.

population: an interbreeding group of organisms of the same species.

renewable resource: a resource that can be continuously replaced through natural processes if it is not overused or contaminated.

solid waste: discarded solid or semi-solid material, such as paper, metals, and yard refuse.

sustainable ("development" or "growth"): consumption of natural resources that meets present needs and that allows future generations to meet their needs.

Resources

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Bartolomeo, Nick, and Laury Marshall, eds. *Monitoring Sustainability in Your Community.* Gaithersberg, MD: The Izaak Walton League of America, 1996.

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World Wide Web Sites

CUBE: The Center for Understanding the Built Environment:
http://www.webcom.com/~pcj/cube.html

ERIC/CSMEE (Educational Resources Information Center/Clearinghouse for Science, Mathematics, and Environmental Education) Environmental Education On-Line Service:
http://www.ericse.org/eric/csmee/environment/environment.html

EnviroNet Monitoring Projects:
http://whale.simmons.edu/environet-stuff/monitoring

The Global Rivers Environmental Education Network:
http://www.igc.apc.org/green/greeninfo.html

The National Consortium for Environmental Education and Training:
http://www.nceet.snre.umich.edu/

National Wildlife Federation:
http://www.nwf.org/nwf

Project WILD:
http://eelink.umich.edu/wild/

Society and Culture:
Environment and Nature: Projects:
http://www.yahoo.com/Society_and_Culture/Environment_andNature/ Projects/

Spider web graphics and information:
http://dns.ufsia.ac.be/Arachnology/Pages/A_pictur.html
http://www.xs4all.nl/~ronlog/argiopidae.htm
http://www.xs4all.nl/~ronlog/agelenidae.htm
http://www.xs4all.nl/~ronlog/spindraad.htm
ftp://photo1.si.edu/images/gif89a/science-nature/ssilk1.gif
ftp://photo1.si.edu/images/gif89a/science-nature/ssilk2.gif

Organizations

The Center for Children's Environmental Literature
Smithsonian Environmental Research Center (SERC)
P O Box 28
Edgewater, MD 21037-0028

Center for the Study of Community
4018 Old Santa Fe Trail
Santa Fe, NM 87505

Earth Force
1501 Wilson Boulevard, 12th Floor
Arlington, VA 22209

North American Association for Environmental Education
1255 23rd Street, NW
Suite 400
Washington, DC 20037

National Geographic Society
Educational Services, Dept. 90
1145 17th Street NW
Washington, D.C. 20036

National Wildlife Federation
Educational Outreach
8925 Leesburg Pike
Vienna, VA 22184

Project WILD
P O Box 18060, Dept. B
Boulder, CO 80308-8060

Schoolyard Ecology For Elementary School Teachers
Institute of Ecosystem Studies
P O Box R
Millbrook, NY 12545-0178

World Resources Institute
1709 New York Avennue NW
Washington, D.C. 20006

NATURE ON THE WEB **http://www.nwf.org**
Want to discover Nature and how you can protect it? National Wildlife Federation's World Wide Web site is the place to start. You'll find information, activities and plenty of fun.™

When you're done there, we can help you discover even more about nature on the web. National Wildlife Federation and Infoseek are teaming up to help you search and navigate the very best sites on the environment and conservation. Search the web with NWF and Infoseek at: **http://guide-p.infoseek.com/environment**

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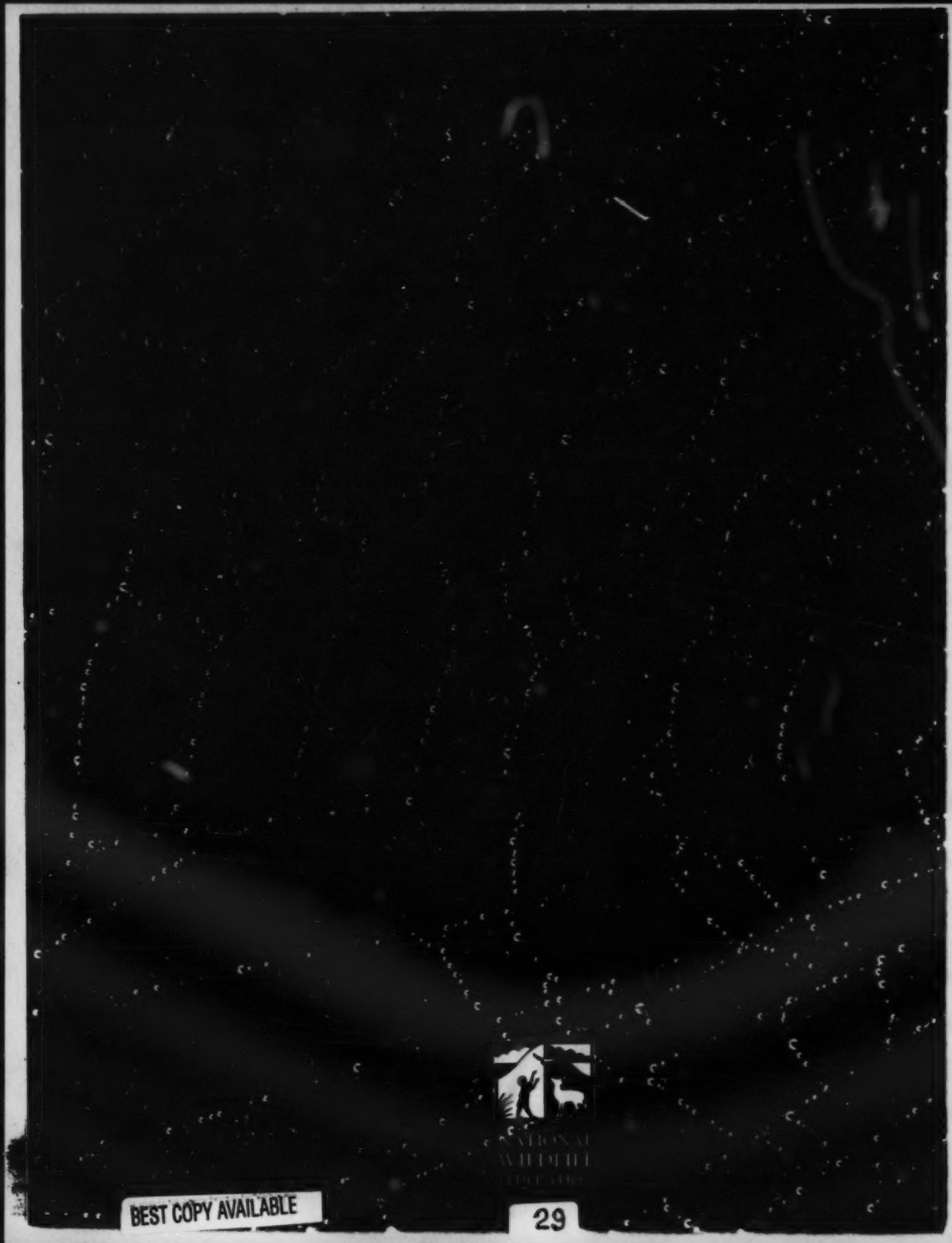

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